

What temperature means (ii)

The temperature changes throughout the day and night. The table below shows the readings made each hour through one day using a thermometer kept in a shaded place.

Q1. When was the hottest time of day?

▼ Table of the temperature through one day.

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Q2. When was the coldest time of day?

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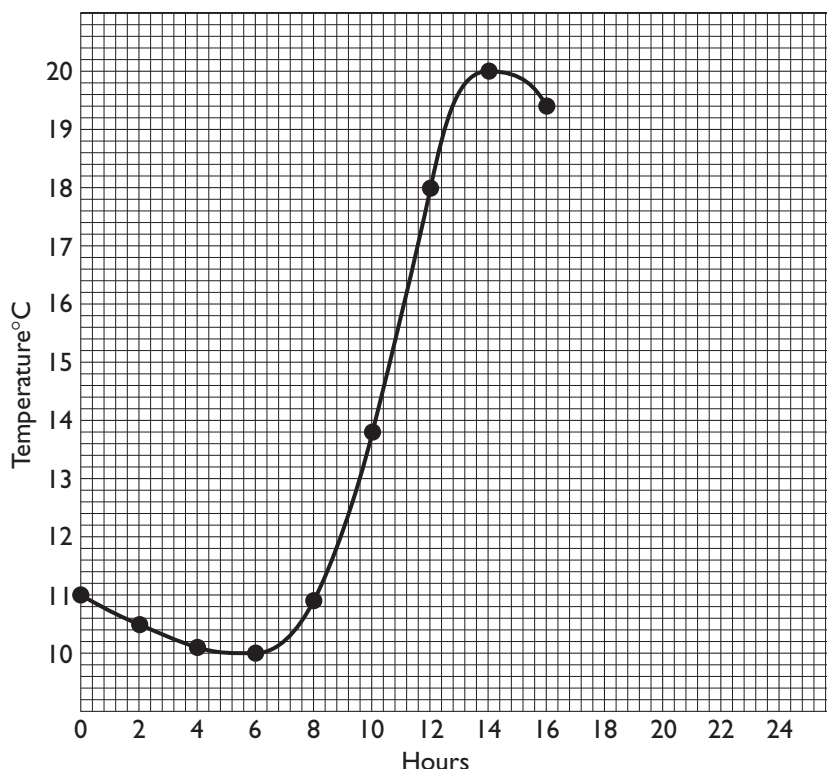
Q3. How many hours was it from midday to the time when the air was hottest?

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Morning		Afternoon	
Time (hr)	Temp. (°C)	Time (hr)	Temp. (°C)
00	11.0	12	18.0
02	10.5	14	20.0
04	10.1	16	19.4
06	10.0	18	17.0
08	10.9	20	13.8
10	13.8	22	12.0

▼ A graph to show the temperature at each hour during a day.

Q4. The first nine points from the table above have been plotted as a graph below. A smooth line has been drawn through them to show you what to do. Complete the graph below to find out what the pattern of temperature looked like throughout the day.



Q5. Now write a sentence to say how the temperature changes throughout a day.

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Background

Drawing graphs

It is important that students get used to drawing out the results of their investigations. In this case there is a table of information which needs to be made into a graph so that it is easier to interpret.

Make sure students are clear that one column of the table is temperature and the other is time. Also make it clear that they will be completing a line graph. A line graph is used because this is continuous data. When the graph is complete, they will be able to find the temperature at any time of the day (for example, 05.45).

This is a good practical opportunity for students to practise plotting co-ordinates on to a graph, as required for the National Curriculum maths. You may need to do it with them in class, so that everyone plots the points at the same time during whole-class teaching.

It is important that students draw a smooth curve through the information. This has been started. If they simply connect the points with straight lines, they will not be able to interpret the changes accurately.

The finished drawing below will give you a template to put underneath the versions done by students to check the accuracy of their plotting.

For much more help on this important part of the mathematics curriculum, see also the book *Grids and Graphs* in the *Maths Matters!* set published by Atlantic Europe Publishing. More conversion graphs will also be found in this book.

Measuring the atmosphere

Here, the emphasis is on thinking about the measurements. A diurnal cycle is shown. Emphasise the following points: that the air is still cooling after dawn because the effect of sunshine is not immediate. We may feel the warmth of the Sun, but it takes time for the ground to heat up and for this heat to be transferred to the air. The air is only very slightly heated by the Sun. The same type of lag occurs between midday and the time of highest temperature.

Answers

Q1. 14 hrs

Q2. 06 hrs

Q3. 2 hours

Q4. See graph below.

Q5. The graph shows that, in the early part of the day the air continues to cool, but then it begins to rise, reaching a maximum in the early afternoon, before decreasing for the rest of the day.

